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density is substantially equivalent to that formed by an ink comprising the self-dispersing pigment in the same amount as that of the colorant.

REMARKS

Status of Claims and Amendments

Claims 1-59 are pending in this Continued Prosecution Application. Claims 37-58 have been withdrawn from further consideration. Claims 1, 12, 19, 30 and 59 are the independent claims under consideration.

Claims 1, 12, 19, 30 and 59 have been amended to recite that the pigment is a self-dispersing pigment, and that the self dispersing pigment and the resin encapsulating a coloring material are dispersed in an aqueous medium. Claim 60, which depends from Claim 59 and specifies that the pigment is a self-dispersing pigment, accordingly has been cancelled without prejudice to or disclaimer of its subject matter. Support for these amendments may be found in the specification at least in Examples 10-12 (see page 62, lines 21-24).

Claim 23 has been amended to improve its form; it is submitted that this amendment does not narrow the scope of the claim.

It is submitted that no new matter has been added by the amendments herein.

Section 103(a) Rejections based on Lin in view of Zou et al., or Sakuma et al.

Claims 1-6, 8-10, 12-15, 17, 19-24, 26-28, 30-33, 35 and 59-60 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 5,851,274 (Lin) in view of either U.S. Patent No. 5,622,648 (Zou et al.) or U.S. Patent No. 5,877,235 (Sakuma et al.). Applicant respectfully requests reconsideration of this rejection.

Before addressing the merits of the rejection, Applicant believes it will be helpful to review some features of the invention as presently claimed. Claim 1 relates to an aqueous ink for ejecting by an ink-jet process. The ink comprises a self-dispersing pigment and a resin encapsulating a coloring material. The self-dispersing pigment and the resin are dispersed in an aqueous medium. Claim 12 is similar to Claim 1, but further specifies that the self-dispersing pigment has a cationic group. Claims 19 and 30 each relate to an ink cartridge comprising an ink container containing an ink similar to that of Claims 1 and 12, respectively. Claim 59 recites an ink similar to that of

Claim 1, wherein the ink provides an image whose optical density has certain features. In Applicant's view, the cited references neither teach nor suggest the features of the claimed invention.

Lin discloses an ink jet ink comprising pigment such as carbon black, which may be present with or without a dispersant. In the Office Action of April 20, 2000, at page 9, the Examiner acknowledges that Lin does not disclose the use of resin encapsulating a coloring material. Zou et al. is cited as disclosing the use of resin-encapsulated colorant wherein the colorant is a pigment or dye.

In response to the Applicant's previous argument that the invention of Zou et al. is an ink to be used for digital duplicators, not for ink-jet printing, at page 13 of the December 13, 2000 Office Action the Examiner asserts that the functions of the resin encapsulated colorant disclosed in Zou et al. are especially pertinent with respect to the present invention.

In Zou et al., however, the functions of the colorant are explained as solutions to the technical problems peculiar to digital duplicators. The ink for the digital duplicator of Zou et al. is a water-in-oil emulsion ink containing an encapsulated colorant in the oil phase. Thus,

Applicant submits that even a person of skill in the art would not apply the technology of Zou et al. to an aqueous medium-based ink jet ink, and that the combination of Lin and Zou et al. does not teach or suggest all the features of the claimed invention.

The Examiner refers to "bleed through" as being one of the technical problems described in Zou et al. (April 20, 2000 Office Action, pages 9-10). Applicant submits that this "bleed through" is completely different from the bleeding mentioned in the present specification. As described in Zou et al. (column 1, lines 45-53), "bleed through" means that the colorant is carried along with the water phase diffusing through the paper. In contrast, "bleeding" in ink jet printing means color mixing at the boundaries of two color regions when a multi-color image is formed with color ink-jet inks. Although the names resemble each other, the technical problems they represent are different. Accordingly, Applicant concludes that even a person of skill in the art would not think to apply the ink of Zou et al. to ink-jet printing.

Lin is alternatively combined with Sakuma et al., which discloses an aqueous ink jet ink that is said to provide a printed image exhibiting improved water fastness

and improved fixation without blurring. This ink comprises a suspension of a polymer, preferably a polyester or a polyester polyamide, adsorbing or encapsulating a dye or a pigment, where the surface tension (γ) and the viscosity (η) of the ink and the average particle size (d) of the suspended particles satisfy the following inequality:

$$0.1 \leq \gamma \cdot \eta \cdot d \leq 11.$$

Thus, the ink invention of Sakuma et al. is directed not only to the colorant, but also to the physical properties of the ink such as how to comprehensively control the surface tension and viscosity. Sakuma et al. does not disclose or suggest what effect can be obtained by applying just the colorant to the self-dispersing pigment ink of Lin, nor does it teach or suggest the advantageous effect of the present invention that rub-off resistance of an image formed with a pigment ink can be improved while maintaining a high image density of the pigment ink.

Accordingly, Applicant concludes that the present invention is not obvious over Lin in view of either Zou et al. or Sakuma et al.

Claims 7, 16, 25, and 34 were rejected under 35 U.S.C. § 103(a) as allegedly obvious unpatentable over Lin in

view of either Zou et al. or Sakuma et al. and further in view of U.S. Patent No. 6,025,412 (Sacripante et al.) Claims 11, 18, 29 and 36 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Lin in view of either Zou et al. or Sakuma et al., and further in view of U.S. Patent No. 5,376,169 (Hotomi et al.) These rejections are respectfully traversed. Sacripante et al. discloses an aqueous ink jet ink containing a resin having hydrophilic groups to which a dye is chemically bonded. Hotomi et al. discloses an ink-jet recording liquid containing micro-capsule particles containing a dye or pigment. Applicant submits that neither Sacripante et al. nor Hotomi et al. discloses an ink containing both self-dispersing pigment and a resin encapsulating a coloring material, dispersed in an aqueous medium, and that this feature enables improved rub-off resistance and high image density. Accordingly, Sacripante et al. and Hotomi et al. do not remedy the deficiencies of the Lin/Zou et al. and Lin/Sakuma et al. combinations noted above. Applicant therefore respectfully requests withdrawal of these rejections.

Section 103(a) Rejections based on Osumi et al.

A number of rejections were made under Section 103(a) based on U.S. Patent No. 5,976,233 (Osumi et al.) in combination with one or more other references.

- Claims 1-5, 9-10, 12-15, 17, 19-23, 27-28, 30-33, 35, and 59-60 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,031,019 (Tsutsumi et al.) in view of Osumi et al.
- Claims 6-7, 11, 16, 18, 24-25, 29, 34 and 36 were rejected under 35 U.S.C. § 103(a) over Tsutsumi et al. in view of Osumi et al., and further in view of U.S. Patent No. 5,948,155 (Yui et al.), Sacripante et al. and Hotomi et al.
- Claims 1-4, 8-10, 12-15, 17, 19-22, 26-28, 30-33, 35, and 59-60 were rejected under 35 U.S.C. § 103(a) over Osumi et al. in view of either Zou et al. or Sakuma et al.
- Claims 7, 16, 25, and 34 were rejected under 35 U.S.C. § 103(a) over Osumi et al. in view of either

Zou et al. or Sakuma et al., and further in view of Sacripante et al.

- Claims 11, 18, 29, and 36 were rejected under 35 U.S.C. § 103(a) over Osumi et al. in view of either Zou et al. or Sakuma et al., and further in view of Hotomi et al.

In view of the concurrent filing of a Continued Prosecution Application, the present application has a filing date on or after November 29, 1999. Therefore, in accordance with 35 U.S.C. § 103(a), Applicant submits that U.S. Patent No. 5,976,233 to Osumi et al. now does not qualify as prior art under 35 U.S.C. §§ 102(e)/103 against the present application, in view of the following statement of common ownership.

STATEMENT OF COMMON OWNERSHIP

Application No. 09/283,192 and U.S. Patent No. 5,976,233 were, at the time the invention of Application No. 09/283,192 was made, owned by Canon Kabushiki Kaisha.

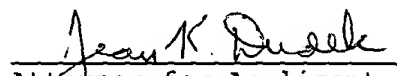
Applicant respectfully requests the withdrawal of the rejections based on the Osumi et al. reference.

Applicant submits that the invention as presently claimed is not anticipated by or obvious over the references cited in the December 13, 2000 Office Action. Applicant therefore respectfully requests that the rejections be withdrawn. Applicant also respectfully requests entry of this amendment and rejoinder of Claims 37-58.

Applicant submits that the instant application is in condition for allowance. Favorable consideration and an early Notice of Allowance are requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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VERSION WITH MARKINGS SHOW CHANGES MADE TO THE CLAIMS

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1. (Twice Amended) An aqueous ink for ejecting by an ink-jet process, comprising a self-dispersing pigment and a resin encapsulating a coloring material, the self-dispersing pigment and the resin encapsulating a coloring material being dispersed in an aqueous medium.

12. (Twice Amended) An aqueous ink for an ink-jet process, comprising a self-dispersing pigment having a cationic group, and a resin encapsulating a coloring material, the self-dispersing pigment and the resin encapsulating a coloring material being dispersed in an aqueous medium.

19. (Amended) An ink cartridge, comprising an ink container containing an ink, which comprises a self-dispersing pigment and a resin encapsulating a coloring material, the self-dispersing pigment and the resin encapsulating a coloring material being dispersed in an aqueous medium.

23. (Amended) The ink cartridge according to Claim 19, [which] wherein the ink further comprises a pigment dispersant.

30. (Amended) An ink cartridge, comprising an ink container containing an ink comprising [either] a self-dispersing pigment having a cationic group, [or a pigment and a pigment dispersant having a cationic group,] and a resin encapsulating a coloring material, the self-dispersing pigment and the resin encapsulating a coloring material being dispersed in an aqueous medium.

59. (Amended) An aqueous ink for an ink-jet printing process comprising a colorant comprised of a self-dispersing pigment and a resin encapsulated coloring material, the self-dispersing pigment and the resin encapsulated coloring material being dispersed in an aqueous medium, wherein the ink provides [providing] an image whose optical density is substantially equivalent to that formed by an ink comprising the self-dispersing pigment in the same amount as that of the colorant.